

PROTECTION FROM OVERFLOW

*and Reclamation of Thirty Thousand
Square Miles of Alluvial Lands of
the Lower Mississippi River*

A National Work



Waters from 31 States of the Union

*A Subject Worthy of the Consideration
of Every Citizen of the United States
and of Special Interest to Commercial
Organizations and Business Men*

Presented by
THE MISSISSIPPI RIVER LEVEE ASSOCIATION
MEMPHIS, TENNESSEE

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Drainage Map of Mississippi River Basin



THE MISSISSIPPI RIVER—THE NATION'S DRAIN- AGE DITCH.

(See Map on Opposite page.)

The area within the heavy black line is the drainage basin of the Mississippi River, embracing thirty-one States and constituting 41 per cent. of the area of the United States.

The shaded area, nearly 20,000,000 acres in extent, is the alluvial country subject to overflow from the waters of this basin.

This alluvial country is the richest in the United States and is larger than the combined States of Massachusetts, Connecticut, New Jersey and Delaware. It is as large as the Kingdoms of Belgium and Holland combined, twice as large as Switzerland and one-half as large as England and Wales.

Its inhabitants have already expended \$60,000,000 for flood protection and the National Government only \$27,000,000. It is not fair that this small area in six States should bear the whole expense of controlling floods coming from the immense area of twenty-five other States.

It is the Nation's duty to make this ditch big enough and strong enough to carry off these waters and prevent the enormous losses caused by them to that part of the territory now inhabited.

It is also a national work to reclaim and make productive the remainder of this fertile country now lying waste because of floods.

A NATIONAL OBLIGATION.

DEMOCRATIC PLATFORM OF 1912:

"We hold the control of the Mississippi River is a national problem; the building of the levees to prevent overflow of the land and its consequent devastation resulting in the interruption of interstate commerce, the disorganization of the mail service and the enormous loss of life and property, impose an obligation which alone can be discharged by the general government."

REPUBLICAN PLATFORM OF 1912:

"The Mississippi River is the nation's drainage ditch. Its flood waters, gathered from thirty-one States, constitute an overpowering force which breaks the levees and pours its torrents over many millions of acres of the richest land in the Union, stopping mails, impeding commerce and causing great loss of life and property. These floods are national in scope and the disasters they produce affect the general welfare. The States unaided cannot cope with this giant problem, hence we believe the Federal Government should assume a fair proportion of the burden of its control, so as to prevent the disasters from recurring floods."

PROGRESSIVE PLATFORM OF 1912:

"It is a national obligation to develop our rivers, and especially the Mississippi, without delay, under a comprehensive general plan. Under such a plan the destructive floods of the Mississippi would be controlled and land sufficient to support millions of people will be reclaimed."

PRESIDENT WILSON SAID:

"In the case of the Mississippi River, it is plain that the Federal Government must build and maintain the levees."

EX-PRESIDENT TAFT SAID:

"I am strongly in favor of expending the whole \$50,000,000 to save that part of the country from floods in a reasonable time, and to provide a proper levee system."

EX-PRESIDENT ROOSEVELT SAID:

"The nation must build the levees and build them better and more scientifically than ever before."

NEW TRADE TERRITORY.

Less than 5,000,000 acres of these alluvial lands are now productive. The other 15,000,000 acres are not swamps, as many believe; they are the most fertile lands in the world; nine-tenths of them are available for cultivation and capable of sustaining the largest agricultural population in the United States.

Before they can be made productive, extensive general drainage systems are necessary and large expenditures must be made for clearing lands, ditches, buildings and other improvements. This expense will be borne by land owners without National or State aid if overflows are prevented.

The opening up of this new and immense trade territory should be of interest and profit to the merchants and manufacturers of the whole country.

The development of this vast section will add more to the Nation's wealth than the Panama Canal, and at one-seventh the cost.

COTTON SUPREMACY OF THE UNITED STATES.

The world's lands capable of producing cotton are limited in extent. Germans, French and English have expended millions in fostering cotton culture in their colonies. Chancellor Lloyd George recently induced the English House of Commons to appropriate \$15,000,000 for the purpose of experimenting in cotton growing in the Soudan. He spoke of "the necessity of rendering English spinners independent of the supply of cotton from the United States," and asserted: "It is necessary to foster the growth of cotton where it will be under British control." With England so anxious to wrest from us our cotton supremacy, the United States should endeavor to retain it.

INCREASE IN COTTON CROP.

The rapid annual increase in cotton consumption and the small increase in supply make the necessity for more cotton a matter of grave concern to all our citizens. The cotton area of the United States is now about 35,000,000 acres, and the largest crop, 16,000,000 bales, was consumed at high prices. Put 15,000,000 more acres of the Mississippi Delta into cultivation and there will

be 7,000,000 more bales. This will help to reduce the high cost of living, a problem the Government is now trying to solve. The increase of this valuable crop by nearly one-half is, in many other ways, worthy of the Nation's efforts.

BALANCE OF TRADE.

Our exports of wheat, meat and timber are annually decreasing and in a comparatively short time will altogether cease. Exports of corn will become smaller because of its steadily increasing production in other countries. No other commodity will go as far toward preserving the balance of trade in our favor as a 50 per cent. larger cotton crop. The value of 7,000,000 bales of cotton and the seed therefrom, at present prices, is \$500,000,000, and as nearly all of this would go abroad, such an annual increase of exports is a matter of national concern.

NATIONAL REVENUES.

Increased population and wealth adds to a nation's revenues. If the now productive alluvial lands of the Lower Mississippi River were protected from floods and the enormous losses caused by them prevented, and if the larger area now lying waste were reclaimed and made productive, the national revenues would be larger. This is not a work of charity for the Government—it is good business.

HOW CAN FLOODS BE PREVENTED?

This question has been answered by scientific authorities in a convincing way, but so many suggestions have been made by others that the public mind is confused and in doubt. Men forget that the way to solve this problem is exactly the same as they would solve one in their own business. If it required engineering skill they would employ engineers, and not be influenced by plans and opinions of persons without experience or scientific knowledge.

Engineers having decided that floods of the Lower Mississippi River can be controlled, and having agreed on the proper method, their decisions ought to be accepted. Unfortunately, there is a widespread tendency to belittle their opinions and to cast doubt on their con-

clusions. The Panama Canal and many other great works in this country were not constructed by advocates of vague and untried methods, but by United States engineers. The world's great tunnels, its railroads, its submarine cables, its bridges, its irrigation systems, etc., were made by engineers and not by the "pseudo scientists of the newspapers," as the Scientific American calls them.

The magnitude and far-reaching results of flood protection of the Lower Mississippi Valley, impose a special obligation on those who are in a position to influence others, to weigh carefully all proposed methods and to refrain from confusing the public mind with untried or impractical remedies, thus delaying, if not preventing, this beneficial work.

REMEDIES NOT APPROVED BY ENGINEERS.

RESERVOIRS.

As far back as 1860 a Commission appointed by the United States, after years of investigation and study of the Mississippi River, reported:

"It has been demonstrated that no advantage can be derived either from diverting tributaries or constructing reservoirs."

The Committee of Commerce of the United States Senate in 1898, after two years exhaustive work, reported:

"The cost of constructing and maintaining a system of reservoirs would be enormous and far greater than the cost of leveeing the entire river basin. This scheme is regarded by engineers as wholly impracticable. Your Committee can discover no just or adequate relief in reservoirs."

Col. C. McD. Townsend, President of the United States Mississippi River Commission, in an address delivered in Memphis, September 26th, 1912, referring to the flood of that year, said:

"It would require over \$73,000,000 to build reservoirs that would hold the water that passed down the river in one day. The cost of storing one day's flow is ample for

all the levee construction required on the river, while if reliance is placed on reservoirs provision must also be made for the other forty-eight days during which the river was above a bank full stage."

In his speech of April 11th, 1913, before the National Drainage Congress in St. Louis, Col. Townsend said:

"To have retained the Mississippi flood of 1912 within its banks would have required a reservoir in the vicinity of Cairo, Ill., having an area of 7,000 square miles, slightly less than the State of New Jersey, and a depth of about fifteen feet; the quantity of material to be excavated in its construction would be over one hundred billion cubic yards and its estimated cost from fifty to one hundred billions of dollars. Such a volume of earth would build a levee line 7,000 miles long and over 150 feet high."

Current Opinion, in its May (1913) issue, referring to the 1913 flood, says:

"In the entire Ohio Valley above Louisville 9,000,000,000 gallons of water fell. It would have taken eighty-seven reservoirs each twenty miles long, one mile wide and twenty-five feet deep to hold it."

This would make one reservoir 1,740 miles long, one mile wide and twenty-five feet deep, and Col. Townsend in his St. Louis speech said:

"This proposed system of reservoirs would have cost hundreds of millions of dollars, and its effect on this year's flood height on the lower Mississippi could not possibly have exceeded six inches."

As these reservoirs would have held only the water which fell above Louisville, how many more reservoirs would have been required to take care of the water of 1913 from the White, Wabash, Cumberland and Tennessee Rivers? Where could land have been obtained for them and what would they have cost?

If scientific knowledge of reservoirs is not to be considered, where can reliance be placed?

REFORESTATION.

The Senate Commerce Committee, above referred to, reported on this subject:

"Nothing in the evidence discloses the fact that the destruction of timber tends to cause or promote floods.

It is the generally accepted opinion that it tends to rather diminish than to increase the rainfall."

Col. Townsend, in his St. Louis speech, says:

"It is, therefore, apparent that even under the most extravagant claims of forestry advocates, reforestation as a means of reducing flood heights on the Mississippi River requires the conversion of too much farming land into wilderness to be practicable. The waste land that can profitably be converted into forest reservations is too limited in area to produce an appreciable effect on floods. It requires from twenty to fifty years to produce a good forest growth and over a century for the leaves of the forest to decay in sufficient quantities to produce the humus which will be satisfactory as an absorbent of rainfall. We cannot afford to delay the drainage of the Mississippi Valley that long."

The Scientific American, in its issue of May 3d, 1913, says:

"There are many records of great torrents flowing over regions which were covered with dense forests. The flood in the Hudson River on March 27th and 29th, 1913, was enormous and caused great damage at Troy and Albany, yet the height which the flood attained and the volume flowing in the river were less than the flood which occurred in February, 1857, and which was caused by water from the southern part of the Adirondack region. In 1857 nearly the whole of this region was covered with primeval forest. Better proof that a forest covering upon a watershed cannot prevent great floods in the streams flowing from it can scarcely be given. Old records show also that in 1832 there was a flood in the Ohio River at Pittsburg which was five feet higher than the flood of April, 1913. In 1832, however, a very large part of the watersheds of the Alleghany and Monongahela was covered with dense forests. The greatest flood height on record in the Mississippi River at St. Louis occurred in 1844 and the next highest in 1775. At both these dates the entire territory drained by the upper Mississippi and Missouri Rivers was in its natural condition. The recent floods (referring to those of 1913) were caused by an extraordinarily heavy rainfall and nothing that man has done in the removal of the forest,

cultivation of the ground or the drainage of swamps, had anything to do with it."

TRIBUTARIES, CUT-OFFS AND OUTLETS.

The United States Commission of 1860 reported:

"It has been demonstrated that no advantage can be derived from diverting tributaries and that the plans of cut-offs and of new or enlarged outlets to the Gulf are too costly and too dangerous to be attempted."

The Senate Commerce Committee in 1898 reported:

"Your Committee can discover neither from the evidence nor from other sources any material relief from the outlet system."

Col. Townsend, in his Memphis speech, said:

"Cut-offs have been repeatedly tried in Europe as a means of reducing floods, but always with disastrous results. A cut-off affords relief at one locality but at the expense of another."

Years ago it was proposed, but not by engineers, to send the Mississippi River to the Gulf through the Atchafalaya River, and owing to pressure brought to bear on the government, a thorough investigation of this scheme was made, and its futility as well as its appalling danger was clearly proven.

LEVEES THE ONLY MEANS OF FLOOD PREVENTION APPROVED BY SCIENTIFIC AUTHORITY.

It has often been asserted that levees cause beds of rivers to rise, and as a proof the River Po in Italy has been cited. The Government Commission of 1860 reported:

"The extreme low water surface of the River Po has not changed perceptibly in more than two centuries, and consequently the bottom of the river has not been elevated during that time."

Col. Townsend, in his Memphis address, said:

"Several hundred years ago a French traveler visited Italy and on his return reported that levees had raised the bed of the Po River. This statement was carefully investigated and found to be untrue, but it has traveled over the whole world wherever rivers have been improved

and vexed the engineers in charge of their improvement. The French engineers have made careful investigation of the leveed rivers of France and found no evidence of such action. The Germans have studied the Rhine, and the Austrians the rivers of Austro-Hungary, and fail to detect it. The United States Mississippi River Commission has made similar observations of the Mississippi River and found more evidence of a scour than a fill."

It is the opinion of all civilian and United States engineers who have studied the subject that a properly constructed levee system is the only feasible and economical method of preventing floods in the Lower Mississippi River. This is also the opinion of the United States Mississippi River Commission, who have had special charge of this part of the river for over thirty years.

The Government Commission of 1860 reported:

"The plan of levees can be relied upon for protecting all of the alluvial bottom lands liable to inundation."

Another United States Commission in 1875 so decided.

The Senate Committee of Commerce in 1898 declared:

"From all the evidence taken by your Committee, it is evident that the basins along the Mississippi River can only be protected from floods by an ample and complete system of levees from Cairo to the Head of the Passes."

Col. Townsend, one of the ablest engineers in this country, was stationed in Memphis for over six years, in charge of this section of the river; he also spent many years on other sections of the river and has investigated the levee systems of foreign countries. In his Memphis speech he said:

"Levees have been tested for ages and have proved uniformly successful, when built to adequate dimensions—no other method of relief from floods has been successfully applied to large streams."

The levees along the Rhine, the Danube, the Po and the Arno—all alluvial streams like the Mississippi—have prevented overflows for hundreds of years. So have the levees of Holland. We do not need to go to Europe for proof of levee efficiency. The levees of the Upper Mississippi District—one hundred miles long—were built



higher and stronger than any others along the river, and have not broken. Even these are not up to the standard proposed by the United States Mississippi River Commission, but they held the unprecedented waters of 1912 and 1913.

The Scientific American puts the case clearly and properly:

"That a few weak places in the levees failed in last year's flood and in this year's, is no fault of the levee system, but it is due to the fact that the levees have been built, not to the height and width and strength that engineers knew to be advisable, but to such dimensions as the land owners along the river were willing to tax themselves for. It is doubtless too much to expect that the general public, deceived as it is apt to be by the pseudo scientists of the newspapers, will form correct opinions of such matters as river regulation and flood control for a long time to come. It may be hoped, however, that the public will learn to rely in such matters on the opinions of expert engineers."

BILLS BEFORE CONGRESS.

The Newlands Bill provides for the appropriation of \$500,000,000 distributed over ten years, \$100,000,000 of which is for the Mississippi River from St. Louis to the Gulf. The other \$400,000,000 goes to other parts of the country for various projects, such as river improvements, reservoirs, canals, artificial lakes, water powers, irrigation systems, drainage, roads, experimental farms, agricultural schools, purchase of forest lands, reforestation of denuded areas, nurseries and many other things. **It does not compel contributions from States or localities.**

The Humphreys-Ransdell Bill provides for the appropriation of \$60,000,000 distributed over five years for the Mississippi River from Cairo to the Gulf, **on condition that \$15,000,000 is contributed by the adjoining States for levees.** Fifteen million dollars of Government funds is allotted to bank revetment for maintaining and improving navigation, and \$45,000,000 to levees for flood protection. The Nation has already expended \$27,000,000 on levees, and if this appropriation of \$45,000,000 is made, it will have contributed \$72,000,000 for flood protection against \$75,000,000 by the States, viz., \$60,000,000 already spent and \$15,000,000 required by this bill.

An equal division of the cost of this great work between the Government and the States is all that fairness should require.

The Mississippi River Levee Association prefers the Humphreys-Ransdell bill, because:

It compels the States affected by overflow to contribute part of the cost of protection.

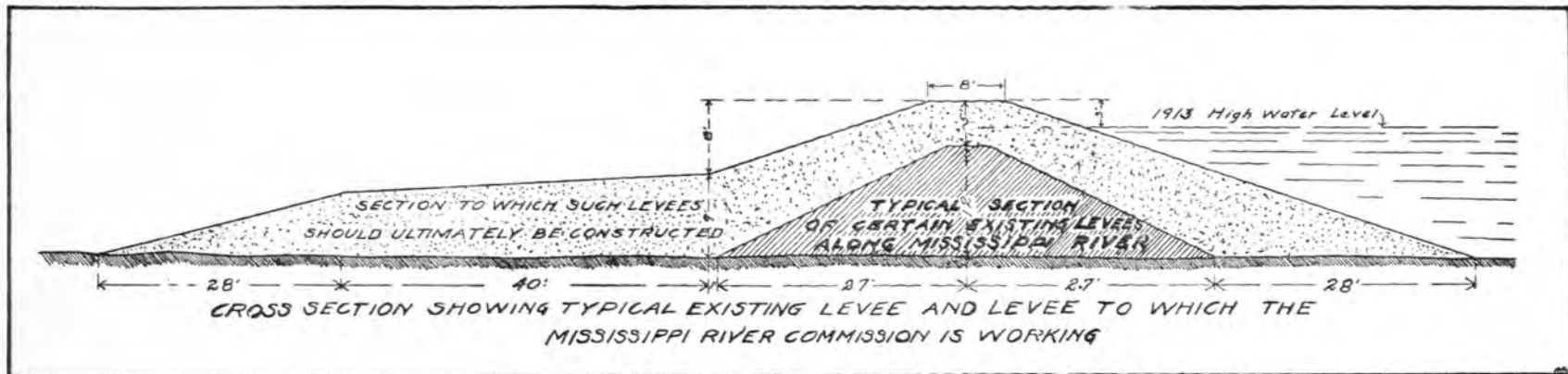
It deals with one project only, of benefit to the whole country, large enough to be treated separately, like the Panama Canal, and which should not be dependent on various other schemes not so national in scope.

It adopts a method of flood control approved by scientific authority and recommended by the engineering branch of the National Government.

It provides an appropriation of \$60,000,000 for one definite object, endorsed by the three political parties and their candidates, instead of \$500,000,000 for varied projects, some of which have not yet been proven feasible.

*See Following Pages for
Levee Cross Section
and Description
Thereof.*

Prepared in United States Engineer's Office, Memphis, Tenn.



EFFICIENT LEVEES PROPOSED BY THE UNITED STATES MISSISSIPPI RIVER COMMISSION.

The heavy shaded portion of the sketch on the opposite page represents a cross section of a present typical levee. The levees in Missouri protect a very narrow strip of alluvial country and are much inferior to this typical levee. The levees in the Upper Mississippi Levee District are higher and stronger than this typical levee, but are not up to the proposed standard.

The lightly shaded or dotted portion represents a cross section of a levee designed by the United States Mississippi River Commission for a system which the Commission declares will prevent future floods and can be built at a cost of \$58,000,000.

Leaving out of consideration the Missouri levees, where no effort was made to hold them in the great flood of 1913, there are 1,355 miles of levees on both sides of the river, and in 1913 there were only seven crevasses, measuring about five miles in length. These crevasses did not occur until the river flow had reached 2,300,000 cubic feet per second, the largest volume of water which has ever passed down the river. This should prove that even the present incomplete levee system is of great value.

Does not this sketch carry conviction that the proposed larger levees will prevent floods?

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Flood Refugees on the Levee